

WHAT IS CLAIMED IS:

1. A system comprising:

a first apparatus to radiate an interference pattern of lines and spaces on a photoresist, the lines having a substantially equal first width, the spaces being exposed to radiation; and

a second apparatus to radiate selected areas of the photoresist, the selected areas exposing portions of the lines to radiation, wherein a pitch of the selected areas exposed by the second subsystem is at least one and a half times a pitch of the interference pattern.
2. The system of Claim 1, wherein a second width of a feature formed by the second apparatus is equal to the first width of a line of the interference pattern.
3. The system of Claim 1, wherein a second width of a feature formed by the second apparatus is less than the first width of a line of the interference pattern.
4. The system of Claim 1, wherein the second apparatus uses optical proximity correction (OPC) on a mask to adjust feature widths.

5. The system of Claim 1, wherein the first apparatus comprises a beamsplitter.

6. The system of Claim 1, wherein the first apparatus comprises a diffraction grating.

7. The system of Claim 1, wherein the second apparatus comprises a mask-based optical lithography tool.

8. The system of Claim 1, wherein the second apparatus comprises an electron beam lithography tool.

9. The system of Claim 1, wherein the second apparatus comprises a maskless optical lithography tool with a database.

10. A method comprising:
forming an interference pattern of non-exposed lines and exposed spaces on a photoresist, the lines having a first width;

exposing a portion of at least one line to radiation to form features with a second width, the second width being less than the first width, wherein a pitch of the features is at

least one and a half times a pitch of the interference pattern.

11. The method of Claim 10, wherein a pitch of the features is greater than one and a half times a pitch of the interference pattern.

12. The method of Claim 10, wherein the radiation has a pre-determined wavelength, the interference pattern approaching a pitch equal to the wavelength divided by two.

13. The method of Claim 10, further comprising generating a print mask from Boolean subtraction of (a) a final design layout for a given layer from (b) the interference pattern.

14. An system comprising:

a first patterning system to produce a first exposed array of lines on a photosensitive media; and

a second patterning system to produce a second exposure, the second exposure reducing regularity of the array formed by the interference exposure apparatus, the second exposure forming features with a second width, the second width being less than a first width of the lines, wherein a pitch of the

features is at least one and a half times a pitch of the exposed array of lines.

15. The system of Claim 14, further comprising an alignment sensor to align the second exposure produced by the second patterning system to the first exposed array formed by the first patterning system.

16. The system of Claim 14, further comprising a common control system to enable the first patterning system and second patterning system to provide first and second exposures to the photosensitive media.

17. The system of Claim 14, where the first patterning system comprises an interference exposure apparatus, and the second patterning system comprises a projection optical lithography system, the projection optical lithography system comprising projection optics, a wafer stage, and a mask to reduce regularity in the array created by the interference exposure apparatus.

18. The system of Claim 14, where the first patterning system comprises an interference exposure apparatus, and the second patterning system comprises an imprint system that

comprises projection optics, a wafer stage, and a mask to reduce regularity in the array created by the interference exposure apparatus.

19. The system of Claim 14, where the first patterning system comprises an interference exposure apparatus, and the second patterning system comprises an electron projection system that comprises projection optics, a wafer stage, and a mask to reduce regularity in the array created by the interference exposure apparatus.

20. The system of Claim 14, where the first patterning system comprises an interference exposure apparatus, and the second patterning system comprises a maskless module to reduce regularity in the array created by the interference exposure apparatus, projection optics and a wafer stage.

21. The system of Claim 20, wherein the maskless module comprises an optical direct write module.

22. The system of Claim 20, wherein the maskless module comprises an electron beam direct write module.

23. The system of Claim 20, wherein the maskless module comprises an ion beam direct write module.

24. The system of Claim 14, where the first patterning system comprises an interference exposure apparatus, and the second patterning system comprises an X-ray proximity projection system that contains mask necessary to reduce regularity in a pattern created by the interference exposure apparatus, projection optics and a wafer stage.